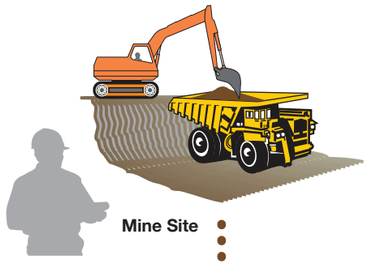
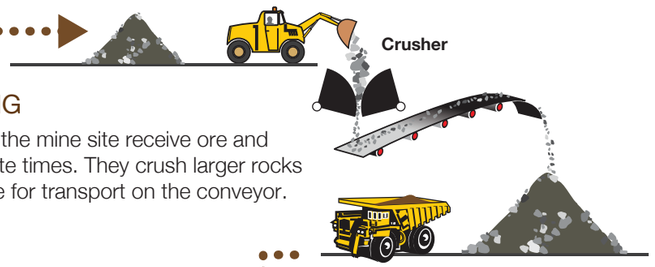
NEWMONT

The Gold and Silver Recovery Process



[1] MINING

To define ore from waste rock, samples are taken along surveyed lines and assayed. Ore and waste rock are then mined separately. Excavation is by hydraulic digger and dump trucks haul the rock to the two crushers.

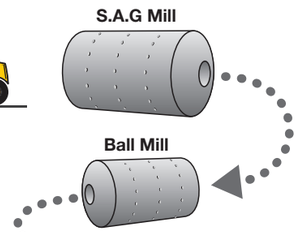


[2] CRUSHING

The crushers at the mine site receive ore and waste at separate times. They crush larger rocks to a size suitable for transport on the conveyor.

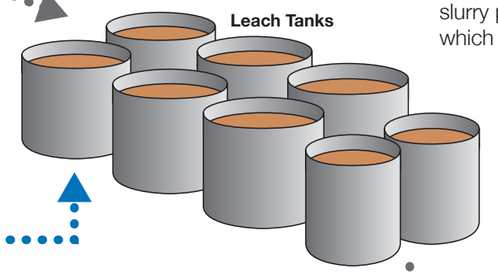
[3] TRANSPORT

A conveyor transports ore and waste rock to the mill and waste rock embankment.



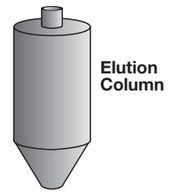
[4] GRINDING & SIZING

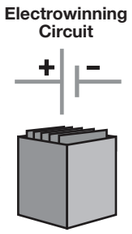
Ore is stockpiled at the mill before being fed into a S.A.G. mill with lime, water and steel balls. The larger particles from this mill are returned to the S.A.G. mill for more grinding. The finer particles are classified to give a final product of 80% <53 microns.



[5] LEACHING & ADSORPTION

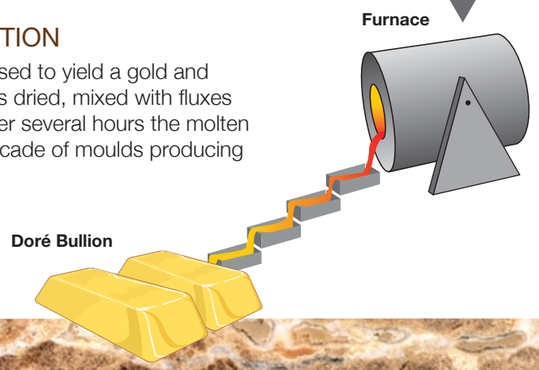
A slurry of ground ore, water and a weak CN solution is fed into tanks where the gold & silver are dissolved. After this leaching process the slurry passes through adsorption tanks containing carbon granules which adsorb 93% of the gold and 70% of the silver.





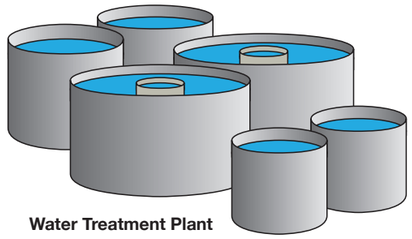
[6] ELUTION & ELECTROWINNING

The loaded carbon is fed into an elution column where the bullion is washed off. The barren carbon is recycled. The wash solution—pregnant electrolyte—is passed through electrowinning cells where gold & silver is won onto stainless steel cathodes.



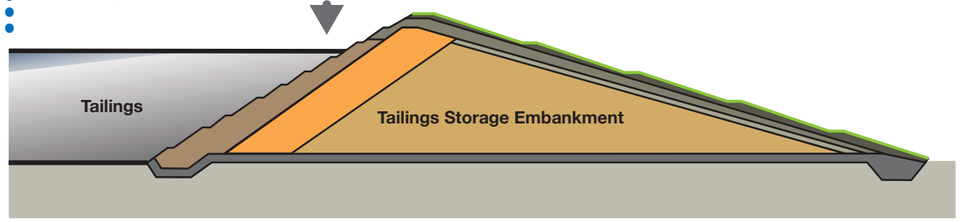
[7] BULLION PRODUCTION

The loaded cathodes are rinsed to yield a gold and silver bearing sludge which is dried, mixed with fluxes and put into the furnace. After several hours the molten material is poured into a cascade of moulds producing bars of doré bullion.



WATER TREATMENT

Some water from dewatering, embankment underdrains and decantation from the tailings pond is used in the grinding circuit. Excess water goes to the Water Treatment Plant for treatment before discharge.



TAILINGS DISPOSAL

Mine waste rock is used to build the embankment structure. The embankment retains the tailings slurry where solids settle and compact.

Water is decanted off and used in the process plant or treated before discharge.

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